SONY

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Xperia™ Tablet Z

SGP311/SGP312

Purpose of this document

Sony product White papers are intended to give an overview of a product and provide details in relevant areas of technology.

Document history

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Sony Mobile Developer World

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Product overview

Xperia™ Tablet Z Wi-Fi – The precision engineered HD tablet

How tablets should have been from the beginning.

So brilliantly vivid, you feel like you're there

Think about the sharpest, most vivid TV picture. Now imagine it on a tablet. Xperia™ Tablet Z delivers the kind of immersive viewing you'd normally only get with an HDTV. Created by the people behind BRAVIA® TVs, Xperia™ Tablet Z brings Sony's expertise to an Android™ tablet. The brilliant 10.1" Reality Display™ is powered by Mobile BRAVIA® Engine 2, which enhances the clarity and richness of every image. This HD tablet boasts the fullest colour display, too. For bluer blues, greener greens and seriously killer sunsets. With Xperia™ Tablet Z you meet a world so vivid, everything else pales in comparison.

Minimal yet distinctive – OmniBalance design

The design of Xperia™ Tablet Z is focused on creating balance and symmetry in all directions. We call it OmniBalance design. OmniBalance™ design balances technology vs. design, letting you get so totally immersed in the content that the hardware disappears.

Xperia™ Tablet Z has subtly rounded edges and smooth, reflective surfaces on all sides, which are held together by an innovative skeleton frame. The glass-paneled front has a seamless surface and enhanced reflective coating. s

Lightning speed performance – Quad core processor

We've matched the latest Sony software with the powerful Qualcomm® Snapdragon™ S4 Pro processor. This advanced 1.5 Ghz quad core processor gives you maximum performance and speed, and incredible graphics, without draining your battery. Run multiple apps simultaneously, surf the web with no loading time, and stream videos without a break. The Snapdragon S4 Pro processor is asynchronous, which means each core is powered up and down independently. So you get the precise amount of power when you need it, without wasting power when you don't.

One-touch connectivity from Sony

Sharing with friends and connecting your world has never been easier. Based on NFC (near field communication), our One-touch functions connect one device to another in a single tap. No wires, cables, or fiddling with settings necessary.

- One-touch sharing: Share photos, music and more between your tablet and smartphone or NFC-enabled laptop.

- One-touch listening: Play the music on your tablet or smartphone through a wireless speaker.

Signature features

The Sony Xperia™ Tablet Z comes with a range of features as standard. Below is a summary of the key signature features.

Xperia™ Local connectivity

More control over your media

Using Local connectivity, you can exercise more control over how media files get transferred and stored.

Xperia™ Home screen application

The place you call Home

Customise your Home screen with widgets, shortcuts, folders, themes, wallpaper and other items. Where's best for you? Email top right? Music player bottom left? You decide. With six extensions to your Home screen, you've got plenty of space to put things where you want. Just remember to flick left or right to find them.

Xperia™ Socialife™*

Use the Socialife application from Sony to get your favorite news, videos and social networking feeds in one place. The Socialife home screen gives a clear overview of friends' Facebook™ and Twitter™ activity, plus news feeds that you have subscribed to. It colour-codes and sizes articles for easy reading, adding photos and cropping images of your friends' faces to illustrate each story.

** This service is not available in all markets.*

Facts – dimensions, weight, performance and networks

Operating system	Google™ Android™ 4.1 (Jelly Bean)
Processor	1.5 GHz Qualcomm APQ8064+MDM9215M Quad Core
GPU	Adreno 320
Size	172x266x6.9 mm
Weight	495 grams
Available colours	Black White
Main screen	
Colours	16,777,216 colour TFT
Resolution	1920x1200 pixels
Size (diagonal)	10.1 inches
Scratch-resistant	Shatter-proof sheet on scratch-resistant glass
Input mechanisms	
Text input	On-screen QWERTY keyboard
Touch screen	Capacitive
Touch gesture	Yes – multi-touch, up to 10 fingers supported
Memory	
RAM	2 GB
Flash memory	Up to 16/32 GB*
Expansion slot	microSD™ card, up to 64 GB
SDXC	Up to 64 GB
Camera	
Camera resolution	8.1 MP
Digital zoom	16x
Video recording	Yes – HD 1080p
Front Camera	Yes – HD 1080p for video chat and 2.2 MP for camera capture
Sensors	
Accelerometer	Yes
Ambient light sensor**	Yes
Magnetometer	Yes

Gyroscope	Yes
Networks	
SGP311 (16 GB) SGP312 (32 GB)	None
Standby time	Up to 890 hours***
Music listening time	Up to 110 hours***
Video playback time	Up to 9 hours 50 mins***
Battery (Embedded)	6000 mAh minimum

** Memory comprises of approximate 2.0 GB firmware, and 11.6/26.1 GB "Internal storage" for music, pictures and movies, and some application data. For more details of memory, See "Memory in Device" on page 15.*

*** There is no API for the light sensor.*

**** Values are according to GSM Association Battery Life Measurement Technique as performed in controlled laboratory conditions. Actual time may vary.*

NOTE: Battery performance may vary depending on network conditions and configurations, and device usage.

NOTE: Performance metrics measured under laboratory conditions.

Categorised feature list

Camera

8.1 megapixel camera
16x digital zoom
Auto focus
Continue Burst Mode
HDR for both picture/movie
Face detection
Front-facing camera (2.2 MP 1080p)
Geotagging
HD video recording (1080p)
Image stabiliser
Object tracking
Picture Effect
Quick launch
Scene recognition
Self-timer
Smile Shutter™
Sony Exmor RS®
for mobile Image sensor
Superior Auto
Sweep Panorama
Touch capture
Touch focus
White balance

Music

3D Surround Sound (VPT)
Album art
Bluetooth™ stereo (A2DP)
ClearAudio+
Clear bass
Clear Phase™
Clear stereo
Dynamic normalizer
PlayNow™ service*
SensMe™
S-Force Front Surround 3D
TrackID™ music recognition*
“WALKMAN” application
xLoud™ Experience

Internet

Bookmarks
Google Chrome™
Google Play™
Google™ search*
Google Voice™ Search*
Google Maps™ for Mobile with Street view and Latitude™*
Google Wallet™
NeoReader™ barcode scanner*
Pan & zoom
Web browser (WebKit™)*

Communication

Facebook™ application*
Twitter™ application*

Messaging

Conversations
Email
Google Mail™*
Instant messaging
Multimedia messaging (MMS)
Predictive text input
Sound recorder
Text messaging (SMS)

Design

Auto rotation
Direct touch
Face Unlock
Gesture input
IPX5/7 (Water-resistant)
IP5X (Dust-proof)
On-screen QWERTY keyboard
Sony Mobile BRAVIA® Engine 2
Screenshot capturing
Touch screen
Throw
Voice input
Wallpaper
Wide color gamut

Entertainment

3D games
Media browser
Motion gaming
PlayStation® Certified
Radio (FM radio with RDS)
SensMe™ slideshow
Sony Entertainment Network*
TV launcher
Video streaming
YouTube™*

Organiser

Airplane mode
Alarm clock
Battery STAMINA mode
Calculator
Calendar
Contacts
eCompass™
Notes
Setup guide
Stopwatch
Timer

Connectivity

3.5 mm audio jack (CTIA)
aGPS*
Bluetooth™ 4.0 wireless technology
DLNA Certified®
GLONASS*
HDCP
HDMI via MHL support
Media Go™
Media Transfer Protocol support
Micro USB support
Native USB tethering
PC Companion
Remote control application
Screen mirroring**
Synchronisation via Microsoft® Exchange ActiveSync®
Synchronisation via Facebook™
Synchronisation via Google™
TV Side view
USB charging
USB High speed 2.0 support
Wi-Fi®
Wi-Fi® Hotspot functionality
Xperia Link™

** This service is not available in all markets.*

*** The video quality may be degraded due to environmental interference.*

Technologies in detail

NOTE: The information outlined below is general and levels of compliance to standards and specifications may vary between products and markets. For more information, contact Sony Mobile Developer World or your Sony contact person where applicable.

Device-to-device communications (local)

Bluetooth™ wireless technology

Bluetooth™ profiles supported	Advanced Audio Distribution Profile v1.2 Audio/Video Remote Control Profile v1.0 Handsfree Profile v1.6 (Wide band speech) Headset Profile v1.1 Object Push Profile v1.1 Phonebook Access Profile v1.0 Message Access Profile Host Interface Device Profile Health Device Profile 1.1 Generic Attribute Profile Client/Server over LE Proximity Monitor Profile over LE
Core version and supported core features	Version 4.0
Connectable devices	Products supporting at least one of the profiles above. BT4.0 accessories generally require installation of a supporting application.

More information:

www.sonymobile.com/developer

www.bluetooth.com

Wi-Fi®

Supported standards	IEEE 802.11a/b/g/n and Wi-Fi® Wi-Fi Direct™, Wi-Fi Protected Setup
Connectable devices	Wi-Fi® access points Wi-Fi Direct compatible devices
Frequency band	2.4 GHz/5 GHz
Data transfer rate	Up to 150 Mbit/s
Security	WEP Open Authentication WEP Shared Authentication WPA Personal and WPA2 Personal WPA Enterprise and WPA2 Enterprise EAP-TLS EAP-TTLS/MSCHAPv2 PEAPv0/EAP-MSCHAPv2 PEAPv1/EAP-GTC
Encryption	WEP 64 bit, WEP 128 bit, TKIP and CCMP (AES)
Power save	WMM-PS, IEEE-PS
QoS	WMM

DLNA Certified® (Digital Living Network Alliance)

Supported Device Classes	**M-DMS – Mobile Digital Media Server** Media Types: images, music and video Summary: The digital media server exposes the media files in your device to a Wi-Fi® network. The files can then be accessed from other DLNA Certified® clients. **+PU+** Media Types: image, video and music Summary: Play media in the tablet on another device, such as a TV or computer using 2 box push technology. +PU+ is integrated in the Album, Movies and Walkman applications. **M-DMP – Mobile Digital Media Player** Media Types: image, video and music Summary: Play content stored on another device, for example, a server or a PC, directly on the tablet. **+DN+** Media Types: video and music Summary: Download content stored on another device, for example, a server or a PC, and play the downloaded content directly on the tablet.
Supported Bearers	Wi-Fi® Wi-Fi Direct
DRM Support	The DLNA Certified® implementation does not support DRM-protected content.

Messaging

MMS (Multimedia Messaging Service)

According to OMA Multimedia Messaging Service v1.0 + SMIL

Email

Bearer type (IP)	GPRS, EGPRS, UMTS
Character sets	BIG5 Traditional Chinese GB18030 ISO-2022-JP Japanese ISO-8859-1 ISO-8859-2 Eastern Europe ISO-8859-5 Cyrillic ISO-8859-7 Greek ISO-8859-9 Turkish ISO 8859-11 KOI8-R Cyrillic Shift_JIS Japanese USASCII UTF-16 UTF-8 Windows® 874 Windows® 1251 Cyrillic Windows® 1252 Windows® 1254 Turkish Windows® 1258 Vietnamese
Protocols	POP3 and IMAP4
Push email	Microsoft® Exchange ActiveSync® (EAS)
Secure email	SSL/TLS, both port methods (POPS/IMAPS) and START-TLS
HTML mail	Yes (read only)

More information:

www.sonymobile.com/developer

www.openmobilealliance.org

Positioning – location based services

Supported standards:

- Qualcomm® GPSOneXtra™

Supported satellite systems:

- GPS
- GLONASS*

* **NOTE***:* GPS and GLONASS are used together to calculate the position. Positioning is more robust and accurate in most conditions, if both systems are active. In conditions where the GLONASS receiver will not add any improvement it is automatically disabled to save power. The benefits of using GLONASS are automatically available for all applications using the Satellite Positioning API ("GPS Provider" in Android terminology).

Provisioning (OMA CP)

OMA CP version 1.1

Multimedia (audio, image and video)

Audio Playback	**Decoder format**	**Supported in file format**
	MP3	MP3 (.mp3), AVI (.avi, .xvid)
	AAC LC, HE-AAC v1, HE-AAC v2, AAC ELD	3GPP (.3gp), MP4 (.mp4), MKV (.mkv), MPEG-TS (.ts)
	AMR-NB, AMR-WB	3GPP (.3gp)
	General MIDI (GM)	SMF (.mid)
	Linear PCM, PCM/WAVE 8-bit and 16-bit	WAV (.wav), AVI (.avi), MKV (.mkv)
	Ogg vorbis	Ogg vorbis (.ogg)
	FLAC	FLAC (.flac)
Audio Recording	**Encoder format**	**Supported in file format**
	AMR-NB, AMR-WB	3GPP (.3gp), MP4 (.mp4), AMR (.amr)
	AAC-LC	3GPP (.3gp), MP4 (.mp4)
Image Playback	**Decoder format**	**Supported in file format**
	1, 4, 8, 16, 24 and 32 bpp and RLE encoded formats	BMP (.bmp)
	Single and multi-frame, bitmap mask support (GIF87a format and GIF89a format)	GIF (.gif)
	JPEG	JPEG (.jpg)
	PNG	PNG (.png)
Image Capture	**Encoder format**	**Supported in file format**
	JPEG	JPEG (.jpg)
Video Playback	**Decoder format**	**Supported in file format**
	MPEG-4 1080p (1920x1080) Advanced Simple Profile Level 5 20 Mbps at 30 fps	3GPP (.3gp), MP4 (.mp4), Matroska (.mkv), AVI (.avi, .xvid)
	H.264 1080p (1920x1080) High Profile Level 4 20 Mbps at 30 fps	3GPP (.3gp), MP4 (.mp4) Matroska (.mkv), MPEG2-TS (.ts, AAC audio)
	H.263 Profile 0 Level 70	3GPP (.3gp), MPEG-4 (.mp4)
	VP8	WebM (.webm), Matroska (.mkv)

Video Recording	Encoder format	Supported in file format
	Video: H.263 Profile 0, H.264 1080p (1920x1080) High Profile Audio: AAC-LC stereo, AMR-NB	3GPP (.3gp), MP4 (.mp4)
Audio/Video Streaming	Streaming transport	RTSP, HTTP / HTTPS, HLS
DRM	DRM (Digital Rights Management) – features the rights and copy protection of downloaded content	OMA DRM 1.0 Marlin DRM

Synchronisation (OMA DS, EAS, Google Sync™)

OMA Data Synchronisation protocol versions 1.1.2 and 1.2

OMA Data Formats: vCard 2.1, vCalendar 1.0

Microsoft® Exchange ActiveSync® protocol version 2.5

Microsoft® Exchange ActiveSync® protocol version 12

Microsoft® Exchange ActiveSync® protocol version 12.1

Microsoft® Exchange ActiveSync® protocol version 14

Microsoft® Exchange ActiveSync® protocol version 14.1

Google Sync™

Related information:

www.sonymobile.com/developer

Web browser

Google™ Chrome for Android™ is pre-installed.*

Related information:

https://play.google.com/store/apps/details?id=com.android.chrome

* Google™ *Chrome is not available for all markets.*

Memory in Device

To use Android devices efficiently, users should be aware of the different types of memory. This knowledge is important in order to understand, for example, where music, photos and videos are saved; how many apps can be downloaded from Google Play™; and how photos can be copied to a PC.

The below information is also of interest to developers who wants to make their programs able to make the best possible use of the resources in the device.

Generally, all Android devices share the same basic memory setup. What differs is how much memory is available to you via the different types of memory, and whether your device uses an external SD card or an internal memory chip. Any information specific to the particular device model described in this White Paper is noted as such.

Types of memory

The types of memory described below are consistent with the terminology used in Sony mobile device menus and in other content relating to 2013 Xperia™ devices:

1. **Dynamic Memory** (also known as RAM) is used by applications that run when the device is turned on. The amount of Dynamic Memory influences how many applications and operating system services can run at the same time. In Android™, the operating system automatically closes applications and services that are not being used.

   However, such automatic functionality has limits. For example, if a lower amount of free RAM is available to applications after a new release of the operating system (due to increased capabilities in the system), device speed will eventually be impacted (this is the main reason that a certain device cannot be indefinitely upgraded to newer releases of Android™).

   If you experience problems with RAM, for example, if the device runs slower than usual or if the Home application restarts frequently when you leave an application, you should minimize the use of apps that run all the time. Such apps could include, for example, applications that frequently download social service updates. You could also consider using a static wallpaper instead of a live wallpaper.

   To see which apps and services are currently active, go to **Settings > Applications > Running Services**. You should have at least 50 MB, and ideally 100 MB or more, of free RAM to avoid slowdowns and application restarts.

   You should also be aware that if you update the device to a later Android release, the load on the built-in Dynamic Memory will increase due to the addition of more features, as mentioned above. As a result, the device may run slower after an update.

2. **System Memory** (also known as “System partition” or “/system”) is used for the Android OS and for most applications that are pre-loaded from the factory. This type of memory is normally locked, and can only be changed through a firmware upgrade. There is usually some free space available in this section of memory. However, since it is locked, you cannot save apps, photos or any other content to this memory. System Memory is reserved for future firmware upgrades, which almost always need more memory than the original firmware. You cannot see or influence the use of this memory.

3. **Internal Storage** is memory used as” working” memory. It can be compared to the C: drive on a PC or to the startup disk on a Mac.

   This memory is used to store all application downloaded from Google Play Store™ (and other sources) and their settings and data (such as emails, messages, calendar events and the like). All applications have an allocated area which no other applications can access and where the application data can be

stored.

Some games also stores content such as games music and level information outside their own designated area; and generally, any application can choose to save their data in locations of their own choosing (outside the protected application settings areas). Generally, such content is not deleted when an application is uninstalled but must be removed manually, by connecting the device to a computer with a USB cable, or by the use of a file manager application.

Internal Storage is also used for all user content added, for example, as a result of the user taking photos with the camera, downloading media files, and performing file transfers. Typical user content includes:

- photos
- movies
- music
- downloaded documents (as email attachments, for example)

Internal Storage will tend to fill up as a result of normal usage: use of applications saving their data, downloading and installing new applications, downloading free or bought content and taking pictures and movies. Therefore, the larger this memory is from the start, the more applications you can download and use, and the more pictures and movies you can take.

If the Internal Storage starts to get full, the device slows down, and in some cases it might no longer be possible to install more apps. You should always ensure that you have at least 100 MB of free device Memory. If not, you should consider removing some apps that you seldom use, or move content you do not frequently access to safe storage.

You can see how much Internal Storage is free in **Settings** > **Storage** >**Internal Storage**. You can also view more detail about how much memory is used by applications in **Settings** > **Applications** > **Manage Applications**.

Please note that in Sony Mobile 2013 products, “Internal Storage” is now the union of what was previously known as “device Memory” (for applications and their data. “/data”) and “Internal Storage” (for user’s content, “/sdcard”). The reason for this change is to make the use of available memory more flexible, and also to enable the optional encryption of user’s content.

Memory card slot

In some products you may find both a large internal memory and a memory card reader slot. However, on the current Android platform, the card reader slot does not work in the same manner in a device with large internal memory, as in a device with ONLY a memory card slot.

Generally, since most applications expect only a single location of storage, such applications will not generally allow you to SAVE anything to the card (i.e. they will lack an option to choose storage location); however, some applications (for instance, the Sony Mobile “Camera” application) may actually allow you to do so. Other, for example backup applications such as the Sony Mobile “Memory” application, will by definition be configured to copy content from the Internal Storage to the external SD card.

On the other hand, when it comes to READING from an external SD Card, you will be able access content (videos, photos, music) on a memory card inserted in this slot without any special considerations since the Android system searches all available memory for content. Therefore, such products may be regarded as supporting a fourth type of memory, called “External Card”.

4. **SD Card** (known as "/ext_card" from a programmer's point of view, or by other names in other Android products) is the name for the removable SD memory card in all 2013 Sony Mobile products. As described above, this External Card memory is generally more limited in that any application can READ from it, but many applications cannot SAVE to this card. Only a few applications, including back-up applications and file manger applications, has the capability to save to this card.

Backing up data to different memory types
Generally, you should not save photos, videos and other personal content solely on the internal memory of a device. If something should happen with the hardware, or if the device is lost or stolen, the data stored on the device's internal memory is gone forever.

In a device where an SD card reader is the main memory, it is relatively easy to take the card out and copy all content to a PC or Mac, or to an entertainment device with a memory card slot. In a product featuring Internal Storage as the main memory, it is not possible to physically remove the memory. Instead, any critical or high-value content must either be copied to an external SD card by a special backup application, transferred to remote storage over a network (mobile or Wi-Fi), or to a computer via a USB cable.

To facilitate the transfer of data via a cable, the Xperia™ Tablet Z supports the Microsoft standard, Media Transfer Protocol (MTP), which makes it possible to easily transfer content back and forth between your device and a Windows PC. For Apple Mac computers, a special application, BridgeforMac, is available offering built-in support for MTP; this application can be downloaded from the Xperia™ Tablet Z Support page.

Note that you do not need to back up or make a copy of applications that you have downloaded from Google Play™. They can normally be downloaded again if, once you have set up your Google account to work in a new device (or a device where the memory has been completely erased).

Note 1:
As noted above, some Android devices, including Sony Mobile devices from 2012, and Sony Ericsson devices from 2011 and earlier, do not use a single "Internal Storage" for both applications (and their data) and user content. Instead, these devices use either an external SD card for user content, or a corresponding area of internal memory to reproduce the functionality of an SD card. In such devices, there is a fixed limit between the application area ("/data") and the user content area ("/sdcard); with the result that user content can be filled, stopping the taking of new pictures for example, while there is still considerable free space in the application area; or vice versa, stopping the download and installation of new applications even though there is free memory in the content area.

Note 2:
Some devices with an integrated storage have abandoned the distinction between the application area and the content area when it comes to Factory Data Reset. As a result, there is no choice to do Factory Data Reset and preserve content; in such devices, all content is mandatorily and completely deleted from the device when a reset is performed.

In contrast, Sony Mobile has done the integration in a manner which makes it possible to preserve user content in this situation; therefore, when performing a Factory Data Reset, the default will still be to only remove applications and their data, and an option box must be checked if also all content is to be removed (as might be desirable when selling the device second-hand, for instance).

Note 3:
For a developer, it is important to note that from a programmer's point of view, the location names used to refer to the different memory areas described in Note 1 are still valid; i.e., the area used for application (/data) is still present, as is the area used for content (/sdcard).

In reality, “sdcard” is a so-called symbolic link to “/data/media”, but from inside an Android application, “/sdcard” can still be used (for instance, use “sdcard/DCIM/100Android” to find all camera images). Continuing to use /sdcard to access the content area ensures compatibility across different products and Android releases in this regard.

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